

WHAT IS CLAIMED IS:

1. A method for etching semiconductor wafers using a batch-type etching device comprising a reaction chamber, an exhaust port, a wafer supporting boat, a microwave generator, and an inlet port, said method comprising:
 - evacuating said reaction chamber using said exhaust port,
 - introducing an etching gas using said inlet port until a pressure is attained,
 - etching said semiconductor wafers,
 - evacuating said reaction chamber after the etching of said semiconductor wafers, and
 - removing residual substances from surfaces of said wafers by heating with microwaves from the microwave generator said wafers by oscillation of polar molecules of the residual substances.
2. The method according to Claim 1, wherein the microwaves are applied from an outside of said reaction chamber to said wafers through a continuous wall of said reaction chamber.
3. The method according to Claim 1, wherein the residual substances are H_2O , CH_3OH , and/or CH_3COOH .
4. The method according to Claim 1, further comprising purging said reaction chamber with N_2 gas during the heating of said wafers.
5. The method according to Claim 1, wherein said wafers are stacked vertically, and the microwaves are applied from a side of the stacked wafers.
6. The method according to Claim 1, wherein said etching gas comprises HF gas and at least one type of H_2O gas, CH_3OH gas, or CH_3COOH gas.
7. A method for etching semiconductor wafers using a batch-type etching device comprising a reaction chamber, an exhaust port, a wafer supporting boat, a microwave generator, and an inlet port, said method comprising:
 - evacuating said reaction chamber using said exhaust port,
 - introducing an etching gas using said inlet port until a pressure is attained,
 - etching said semiconductor wafers for a first time period,
 - evacuating said reaction chamber after said first time period;

applying microwaves from an outside of said reaction chamber to said semiconductor wafers for a second time period using said microwave generator; and
purging said reaction chamber with N₂ gas.

8. The method according to Claim 7, wherein the microwaves are applied from an outside of said reaction chamber to said wafers through a continuous wall of said reaction chamber.

9. The method according to Claim 7, wherein the residual substances are H₂O, CH₃OH, and/or CH₃COOH.

10. The method according to Claim 7, wherein said wafers are stacked vertically, and the microwaves are applied from a side of the stacked wafers.

11. The method according to Claim 7, wherein said etching gas comprises HF gas and at least one type of H₂O gas, CH₃OH gas, or CH₃COOH gas.

12. A method for etching semiconductor wafers using a batch-type etching device comprising:

providing a reaction chamber, an exhaust port, a wafer supporting boat, a microwave generator, and an inlet port,
evacuating said reaction chamber using said exhaust port,
introducing a reaction gas using said inlet port until a pressure is attained,
etching said semiconductor wafers for a first time period,
evacuating said reaction chamber after said first time period, and
applying microwaves to said semiconductor wafers for a second time period using said microwave generator.

13. The method according to Claim 12, wherein said reaction chamber and said wafer-supporting boat are comprised of a material which has corrosion resistance against HF and which is transparent to microwave energy.

14. The method according to Claim 12, wherein said reaction chamber and said wafer-supporting boat are comprised of Al₂O₃ or polypropylene.

15. The method according to Claim 12, wherein the frequency of said microwaves is 2.45 GHz.

16. The method according to Claim 12, wherein said reaction gas comprises HF gas and at least one type of H₂O gas, CH₃OH gas, or CH₃COOH gas.

17. The method according to Claim 12, further comprising purging said reaction chamber with N₂ gas after applying said microwaves.